

REMARKS

Claims 1-36 are pending in the Application. The title of the Specification is objected to. Claims 6-20 are objected to. Claims 1 and 3 are rejected under 35 U.S.C. §102(a). Claims 2, 4-6, 13, 15, 21-22, 29 and 31 are rejected under 35 U.S.C. §103(a). Claims 7-12, 14, 16-20, 23-28, 30 and 32-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants address the objections and rejections below.

Applicants' attorney has left a couple voice messages with the Examiner in hopes of discussing the claim objections and the rejection to claim 1.

I. OBJECTIONS TO THE SPECIFICATION:

The Office Action objects to the title of the Specification for not being descriptive. Office Action (6/29/2006), page 2. Applicants amended the title of the Specification, as indicated above, to more clearly indicate the invention to which the claims are directed. Applicants respectfully request the Examiner to withdraw the objections to the Specification.

II. CLAIM OBJECTIONS:

The Office Action objects to particular claim language (lines 4-7) in claim 6 for being unclear. Office Action (6/29/2006), page 2. Applicants amended claim 6 as indicated above to more clearly state the claimed subject matter. Applicants respectfully request the Examiner to withdraw the objections to the claims.

Applicants note that claim 6 was not amended to overcome prior art but to more clearly state the claimed subject matter. Hence, no prosecution history estoppel arises from the amendment to claim 6. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 62 U.S.P.Q.2d 1705, 1711-12 (2002); 56 U.S.P.Q.2d 1865, 1870 (Fed. Cir. 2000). Further, the amendment made to claim 6 was not made for a substantial reason related to patentability and therefore no prosecution history estoppel arises from such an amendment. *See Festo Corp.*, 62 U.S.P.Q.2d 1705 at 1707 (2002);

Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 41 U.S.P.Q.2d 1865, 1873 (1997).

III. REJECTIONS UNDER 35 U.S.C. §102(a):

The Office Action rejects claims 1 and 3 under 35 U.S.C. §102(a) as being anticipated by Kahle et al. (U.S. Patent No. 6,654,869) (hereinafter "Kahle"). Appellants respectfully traverse these rejections for at least the reasons stated below and respectfully request the Examiner to reconsider and withdraw these rejections.

For a claim to be anticipated under 35 U.S.C. §102, each and every claim limitation must be found within the cited prior art reference and arranged as required by the claim. M.P.E.P. §2131.

Applicants respectfully assert that Kahle does not disclose "a completion table, comprising: a plurality of entries, wherein each of said plurality of entries tracks a consecutive number of outstanding instructions, wherein each of said plurality of entries is configured to store an instruction address of a first of said consecutive number of outstanding instructions and an identification of said first of said consecutive number of outstanding instructions" as recited in claim 1. The Office Action cites element 118 of Figure 1 of Kahle as disclosing a completion table. Office Action (6/29/2006), page 3. The Office Action further cites elements 202a, 202b of Figure 2 of Kahle as disclosing the plurality of entries. Office Action (6/29/2006), page 3. Additionally, the Office Action cites elements 201 and 204a-e of Figure 2 of Kahle as disclosing tracking a consecutive number of outstanding instructions. Office Action (6/29/2006), page 3. Furthermore, the Office Action cites element "GTAG" in Figure 2 of Kahle as disclosing the wherein clause of the above-cited claim limitation. Office Action (6/29/2006), page 3. Applicants respectfully traverse.

Kahle instead discloses that a single instruction entering cracking unit 112 is broken down into a set of instructions occupying multiple groups 202. Column 5, lines 1-3. Kahle further discloses that because each group 202 according to the depicted embodiment of processor 100 includes, at most, five instructions, and because the fifth slot 204e is reserved for branch instructions, a load multiple of six

registers breaks down into two groups 202a and 202b respectively. Column 5, lines 10-14. Hence, Kahle discloses that a single instruction entering cracking unit 112 (and not completion unit 118) is broken down into a set of instructions occupying groups 202 where each group 202 is broken down into groups 202a and 202b. There is no language in the description of Figure 2 of Kahle that discloses a completion unit comprising a plurality of entries. Thus, Kahle does not disclose all of the limitations of claim 1, and thus Kahle does not anticipate claim 1. M.P.E.P. §2131.

Kahle further discloses that cracking logic 112 is designed to organize a set of fetched instructions into instruction groups 202, where each instruction group 202 includes a set of instruction slots 204a, 204b, 204c, 204d and 204e. Column 3, lines 39-44. Kahle further discloses that in example 1, a set of instructions indicated by reference numeral 201 is transformed into a single instruction group 202 by cracking logic 112. Column 3, lines 61-64. Hence, the citing to elements 201, 204a, 204b, 204c, 204d and 204e does not disclose a completion table that includes a plurality of entries, where each of the plurality of entries tracks a consecutive number of outstanding instructions. Thus, Kahle does not disclose all of the limitations of claim 1, and thus Kahle does not anticipate claim 1. M.P.E.P. §2131.

Further, Kahle discloses that in the embodiment of processor 100 in which cracking unit 112 organizes incoming instructions into instruction groups as discussed above, each instruction group 202 is assigned a group tag (GTAG) by completion and control logic 116 that conveys the ordering of the issued instruction groups. Column 5, lines 29-35. Hence, the citing to "GTAG" does not disclose that each of the plurality of entries is configured to store an instruction address of a first of the consecutive number of outstanding instructions and an identification of the first of the consecutive number of outstanding instructions. Thus, Kahle does not disclose all of the limitations of claim 1, and thus Kahle does not anticipate claim 1. M.P.E.P. §2131.

Claim 3 recites the combinations of features of independent claim 1 and hence claim 3 is not anticipated by Kahle for at least the reasons that claim 1 is not anticipated by Kahle. Claim 3 recites additional features, which, in combination with the features of claim 1, is not anticipated by Kahle.

For example, Kahle does not disclose "wherein said instruction address is an effective address" as recited in claim 3. The Office Action cites column 6, lines 58-60 of Kahle as disclosing the above-cited claim limitation. Office Action (6/29/2006), page 3. Applicants respectfully traverse and assert that Kahle instead discloses that instruction address 210 of group 202 corresponds to the instruction address of the instruction in the first slot 204a of group 202. Column 6, lines 58-60. There is no language in the cited passage that discloses an instruction address being an effective address. Thus, Kahle does not disclose all of the limitations of claim 3, and thus Kahle does not anticipate claim 3. M.P.E.P. §2131.

Further, the Office Action appears to assert that the instruction in the first slot of a group, as disclosed in Kahle, corresponds to an effective address. Office Action (6/29/2006), page 3. Applicants respectfully traverse. The Examiner must provide a basis in fact and/or technical reasoning to support the assertion that the instruction in the first slot of a group, as disclosed in Kahle, corresponds to an effective address. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). That is, the Examiner must provide extrinsic evidence that must make clear that the instruction in the first slot of a group, as disclosed in Kahle, corresponds to an effective address, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). Since the Examiner has not provided any such objective evidence, the Examiner has not presented a *prima facie* case of anticipation for rejecting claim 3. M.P.E.P. §2131.

As a result of the foregoing, Applicants respectfully assert that not each and every claim limitation was found within Kahle, and thus claims 1 and 3 are not anticipated by Kahle. M.P.E.P. §2131.

IV. REJECTIONS UNDER 35 U.S.C. §103(a):

The Office Action rejects claim 2 under 35 U.S.C. §103(a) as being obvious over Kahle. The Office Action rejects claims 4-5 under 35 U.S.C. §103(a) as being obvious over Kahle in view of Song (U.S. Patent No. 5,546,599). The Office Action further rejects claims 6, 13, 15, 21-22, 29 and 31 under 35 U.S.C. §103(a) as being obvious over Song in view of Kahle and in further view of Siedl et al. (U.S. Patent No. 6,751,709) (hereinafter "Siedl"). Appellants respectfully traverse these rejections

for at least the reasons stated below and respectfully request the Examiner to reconsider and withdraw these rejections.

A. Claim 2 is patentable over Kahle.

Applicants respectfully assert that Kahle does not teach or suggest "wherein said consecutive number of outstanding instructions comprises a length of a cache line" as recited in claim 2. The Office Action states:

It would have been an obvious advantage to create the completion table lines to be the same length as the cache lines as it would increase the coherency of the completion table. By forcing the completion table to be the same size as the cache, one would eliminate the problem of splitting cache lines and therefore would reduce the amount of logic required to issue instructions to the completion table. Furthermore, Kahle uses a group tag which corresponds to a grouping of executable instructions. It would have been obvious to one of ordinary skill in the art at the time of invention that the most logical group would be the cache line group that the instruction are in when received from memory. Office Action (6/29/2006), page 4.

Applicants respectfully traverse the assertion that it would have been obvious to one of ordinary skill in the art to store an instruction of a first of a consecutive number of outstanding instructions which comprises a length of a cache line. Applicants further traverse the assertion that it would have been obvious to modify Kahle to store an instruction of a first of a consecutive number of outstanding instructions which comprises a length of a cache line. The Office Action's motivation for modifying Kahle to include the above-cited claim limitation appears to be based on the Examiner's assertion that it would have been an obvious advantage to create the complete table lines to be the same length as the cache lines as it would increase the coherency of the completion table. The Examiner must provide a basis in fact and/or technical reasoning to support such a statement. *See Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). That is, the Examiner must provide extrinsic evidence that must make clear that it would have been an obvious advantage to create the complete table lines to be the same length as the cache lines as it would increase the coherency of the completion table, and that it would be so recognized by persons of ordinary skill. *See In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). The Examiner has not provided such objective evidence, but instead, relies upon his own subjective opinion. The Examiner's reliance upon his own

subjective opinion is insufficient to establish a *prima facie* case of obviousness. *In re Lee*, 61 U.S.P.Q.2d 1430, 1434 (Fed. Cir. 2002). Consequently, the Examiner has not established a *prima facie* case of obviousness for rejecting claim 3. *Id.*

B. Claims 4-5 are patentable over Kahle in view of Siedl.

1. Kahle and Siedl, taken singly or in combination, do not teach or suggest the claim limitations of claim 4.

Applicants respectfully assert that Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein an instruction address and an identification of a next to complete instruction is calculated using said instruction address of said first of said consecutive number of outstanding instructions and said identification of said first of said consecutive number of outstanding instructions, respectively, in a selected entry of said completion table" as recited in claim 4. The Examiner cites column 4, lines 18-23 of Siedl as teaching the above-cited claim limitation. Office Action (6/29/2006), page 5. Applicants respectfully traverse and assert that Siedl instead teaches that in the event of an eviction from L2 cache 106, translator 108 converts the encoded address containing the object ID and the offset into a physical address. Column 4, lines 18-20. There is no language in the cited passage that teaches calculating an instruction address and an identification of a next to complete instruction. Neither is there any language in the cited passage that teaches calculating an instruction address and an identification of a next to complete instruction using the instruction address of the first of the consecutive number of outstanding instructions. Neither is there any language in the cited passage that teaches calculating an instruction address and an identification of a next to complete instruction using the instruction address of the first of the consecutive number of outstanding instructions and the identification of the first of the consecutive number of outstanding instructions, respectively. Neither is there any language in the cited passage that teaches calculating an instruction address and an identification of a next to complete instruction using the instruction address of the first of the consecutive number of outstanding instructions and the identification of the first of the consecutive number of outstanding instructions, respectively, in a selected entry of the completion table. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 4, since the Examiner is relying upon incorrect, factual

predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

2. Kahle and Siedl, taken singly or in combination, do not teach or suggest the claim limitations of claim 5.

Applicants respectfully assert that Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein said entry is selected based on one of an oldest active instruction and an instruction finished at an execution unit" as recited in claim 5. The Examiner cites column 4, lines 18-23 of Siedl as teaching the above-cited claim limitation. Office Action (6/29/2006), pages 5-6. Applicants respectfully traverse and assert that Siedl instead teaches that in the event of an eviction from L2 cache 106, translator 108 converts the encoded address containing the object ID and the offset into a physical address. Column 4, lines 18-20. There is no language in the cited passage that teaches selecting the entry based on one of an oldest active instruction and an instruction finished at an execution unit. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 5, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

3. Examiner's motivation is insufficient to establish a *prima facie* case of obviousness in rejecting claims 4 and 5.

Most if not all inventions arise from a combination of old elements. *See In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Therefore, an Examiner may often find every element of a claimed invention in the prior art. *Id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. *See Id.* In order to establish a *prima facie* case of obviousness, the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). That is, the Examiner must provide some suggestion or motivation,

either in the references themselves, the knowledge of one of ordinary skill in the art, or, in some case, the nature of the problem to be solved, to modify the reference or to combine reference teachings. *See In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Whether the Examiner relies on an express or an implicit showing, the Examiner must provide particular findings related thereto. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

The Office Action admits that Kahle does not teach the limitation of claim 4. Office Action (6/29/2006), page 5. The Office Action further admits that Kahle does not teach the limitation of claim 5. Office Action (6/29/2006), pages 5-6. The Office Action asserts that Siedl teaches the missing claim limitations for claims 4 and 5. Office Action (6/29/2006), pages 5-6. As understood by Applicants, the Office Action's motivation for modifying Kahle with Siedl to include the claim limitations of claims 4 and 5 is "to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle." Office Action (6/29/2006), page 5. The Office Action's motivation is insufficient to establish a *prima facie* case of obviousness in rejecting claims 4 and 5.

The Office Action's motivation ("to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle") does not provide reasons, as discussed further below, that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Kahle to include the missing claim limitations of claims 4 and 5. Accordingly, the Office Action has not presented a *prima facie* case of obviousness for rejecting claims 4 and 5. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

Kahle addresses the problem of handling exceptions generated by instructions within instruction groups. Column 1, lines 13-45. The Examiner has not provided any reasons as to why one skilled in the art would modify Kahle, which teaches

overcoming the problem of handling exceptions generated by instructions within instruction groups, to: (1) calculate an instruction address and an identification of a next to complete instruction using the instruction address of the first of the consecutive number of outstanding instructions and the identification of the first of the consecutive number of outstanding instructions, respectively, in a selected entry of the completion table (missing claim limitation of claim 4) and (2) select the entry based on one of an oldest active instruction and an instruction finished at an execution unit (missing claim limitation of claim 5). The Office Action's motivation ("to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle") does not provide such reasoning. The Office Action has not provided any rationale connection between the Office Action's motivation and calculating an instruction address and an identification of a next to complete instruction using the instruction address of the first of the consecutive number of outstanding instructions and the identification of the first of the consecutive number of outstanding instructions, respectively, in a selected entry of the completion table (missing claim limitation of claim 4). Neither has the Office Action provided any rationale connection between the Office Action's motivation and selecting the entry based on one of an oldest active instruction and an instruction finished at an execution unit (missing claim limitation of claim 5). Hence, the Office Action's motivation does not provide reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Kahle to include the missing claim limitations of claims 4 and 5. Accordingly, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 4 and 5. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

C. Claims 6, 13, 15, 21-22, 29 and 31 are patentable over Song in view of Kahle and in further view of Siedl.

1. Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest the claim limitations of claim 6.

Applicants respectfully assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "selecting an identification of one of a finished

instruction and an active instruction at one of said first and said second execution unit" as recited in claim 6. The Office Action cites column 8, lines 6-18 of Song as teaching the above-cited claim limitation. Office Action (6/29/2006), page 6. Applicants respectfully traverse and assert that Song instead teaches that the entries of reorder buffer 76 are read by completion logic 80 and exception logic 82 of sequencer unit 18. Column 8, lines 6-8. Song further teaches that the entries of reorder buffer 76 are read by execution serialization logic 84 of sequencer 18. Column 8, lines 9-10. Additionally, Song teaches that in response to the 'exception' fields of reorder buffer 76, exception logic 82 handles exceptions encountered during execution of dispatched instructions. Column 8, lines 10-13. Furthermore, Song teaches in response to the 'finished' fields and 'exception' fields of reorder buffer 76, completion logic 80 outputs signals to dispatch logic 74, to execution serialization logic 84, and to reorder buffer 76. Column 8, lines 14-17. There is no language in the cited passage that teaches selecting an identification of one of a finished instruction and an active instruction. Neither is there any language in the cited passage that teaches selecting an identification of one of a finished instruction and an active instruction at one of the first and the second execution unit. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 6, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "calculating an identification of a next to complete instruction using said selected identification of said one of said finished instruction and said active instruction" as recited in claim 6. The Office Action cites column 8, lines 21-34 of Song as teaching the above-cited claim limitation. Office Action (6/29/2006), page 6. Applicants respectfully traverse and assert that Song instead teaches that the execution unit finishes execution of the instruction (such that 'finished'=1 in the instruction's associated entry in reorder buffer 76). Column 8, lines 21-25. Song further teaches that in response to information in reorder buffer 76, dispatch logic 74 determines a suitable number of additional instructions to be dispatched. Column 8, lines 32-34. There is no language in the cited passage that teaches calculating an identification of a next to complete instruction. Neither is there

any language in the cited passage that teaches calculating an identification of a next to complete instruction using the selected identification of one of the finished instruction and the active instruction. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 6, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table" as recited in claim 6. The Office Action cites column 5, lines 57-59 and column 6, line 65 – column 7, line 1 of Kahle as teaching the above-cited claim limitation. Office Action (6/29/2006), page 6. Applicants respectfully traverse and assert that Kahle instead teaches that the GTAG value is constrained to an integer less than or equal to the number of entries 302 in completion table 118. Column 5, lines 55-58. Kahle further teaches that the LD2 instruction stored in slot 204c may generate any of a variety of exceptions including, address translation exceptions, cache miss exceptions, and a variety of other exception conditions. Column 6, lines 64-67. There is no language in the cited passages that teaches selecting an instruction address. Neither is there any language in the cited passages that teaches selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions. Neither is there any language in the cited passages that teaches selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of the completion table. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 6, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "calculating an instruction address of said next to complete instruction using said identification of said next to complete instruction and said selected instruction address and identification of said first of said consecutive number of outstanding instructions located in said entry of said

completion table" as recited in claim 6. The Office Action cites column 4, lines 18-23 of Siedl as teaching the above-cited claim limitation. Office Action (6/29/2006), page 7. Applicants respectfully traverse and assert that Siedl instead teaches that in the event of an eviction from L2 cache 106, translator 108 converts the encoded address containing the object ID and the offset into a physical address. Column 4, lines 18-20. Siedl further teaches that the fetching circuitry subsequently uses the physical address to generate a store operation to store the evicted cache line in main memory 110. Column 4, lines 20-23. There is no language in the cited passage that teaches calculating an instruction address of a next to complete instruction. Neither is there any language in the cited passage that teaches calculating an instruction address of a next to complete instruction using the identification of the next to complete instruction. Neither is there any language in the cited passage that teaches calculating an instruction address of a next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions. Neither is there any language in the cited passage that teaches calculating an instruction address of a next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions located in the entry of the completion table. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 6, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

2. Claims 13 and 15 depend from independent claim 6, and hence claims 13 and 15 are patentable over Song in view of Kahle and in further view of Siedl for at least the reasons that claim 6 is patentable over Song in view of Kahle and in further view of Siedl.

Claims 13 and 15 each recite the combinations of features of independent claim 6 and hence claims 13 and 15 are patentable over Song in view of Kahle and in further view of Siedl for at least the reasons that claim 6 is patentable over Song in view of Kahle and in further view of Siedl.

3. Claim 13 is patentable over Song in view of Kahle and in further view of Siedl.

Applicants respectfully assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein said selected instruction is a most recently finished instruction at one of said first and said second execution unit" as recited in claim 13. The Office Action cites column 8, lines 21-34 of Song as teaching the above-cited claim limitation. Office Action (6/29/2006), page 8. Applicants respectfully traverse and assert that Song instead teaches that the execution unit finishes execution of the instruction (such that 'finished'=1 in the instruction's associated entry in reorder buffer 76). Column 8, lines 21-25. Song further teaches that in response to information in reorder buffer 76, dispatch logic 74 determines a suitable number of additional instructions to be dispatched. Column 8, lines 32-34. There is no language in the cited passage that teaches that the selected instruction is a most recently finished instruction at one of the first and the second execution unit. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 13, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

4. Examiner's motivation is insufficient to establish a *prima facie* case of obviousness in modifying Song with Kahle to include the missing claim limitation of claim 6.

As stated above, most if not all inventions arise from a combination of old elements. *See In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Therefore, an Examiner may often find every element of a claimed invention in the prior art. *Id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. *See Id.* In order to establish a *prima facie* case of obviousness, the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). That is, the Examiner must provide some suggestion or motivation, either in the references

themselves, the knowledge of one of ordinary skill in the art, or, in some case, the nature of the problem to be solved, to modify the reference or to combine reference teachings. See *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Whether the Examiner relies on an express or an implicit showing, the Examiner must provide particular findings related thereto. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

The Office Action admits that Song does not teach "selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table" as recited in claim 6. Office Action (6/29/2006), page 6. The Office Action asserts that Kahle teaches this missing claim limitation for claim 6. Office Action (6/29/2006), page 6. As understood by Applicants, the Office Action's motivation for modifying Song with Kahle to include this missing claim limitation of claims 6 is "to minimize the space used by Song and thus decrease the overall size of the processor." Office Action (6/29/2006), page 7. The Office Action's motivation is insufficient to establish a *prima facie* case of obviousness in rejecting claim 6.

The Office Action's motivation ("to minimize the space used by Song and thus decrease the overall size of the processor") does not provide reasons, as discussed further below, that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitation of claim 6. Accordingly, the Office Action has not presented a *prima facie* case of obviousness for rejecting claim 6. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

Song addresses the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle. Column 1, lines 39-42. The Examiner has not provided any reasons as to why one skilled in the art would modify Song, which teaches overcoming the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle, to select an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table (missing claim

limitation of claim 6). The Office Action's motivation ("to minimize the space used by Song and thus decrease the overall size of the processor") does not provide such reasoning. The Office Action has not provided any rationale connection between the Office Action's motivation and selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table (missing claim limitation of claim 6). Hence, the Office Action's motivation does not provide reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitation of claim 6. Accordingly, the Examiner has not presented a *prima facie* case of obviousness for rejecting claim 6. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

5. Examiner's motivation is insufficient to establish a *prima facie* case of obviousness in modifying Song with Siedl to include the missing claim limitation of claim 6.

As stated above, most if not all inventions arise from a combination of old elements. *See In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Therefore, an Examiner may often find every element of a claimed invention in the prior art. *Id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. *See Id.* In order to establish a *prima facie* case of obviousness, the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). That is, the Examiner must provide some suggestion or motivation, either in the references themselves, the knowledge of one of ordinary skill in the art, or, in some case, the nature of the problem to be solved, to modify the reference or to combine reference teachings. *See In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Whether the Examiner relies on an express or an implicit showing, the

Examiner must provide particular findings related thereto. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

The Office Action admits that Song does not teach "calculating an instruction address of said next to complete instruction using said identification of said next to complete instruction and said selected instruction address and identification of said first of said consecutive number of outstanding instructions located in said entry of said completion table" as recited in claim 6. Office Action (6/29/2006), page 7. The Office Action asserts that Siedl teaches this missing claim limitation for claim 6. Office Action (6/29/2006), page 7. As understood by Applicants, the Office Action's motivation for modifying Song with Siedl to include this missing claim limitation of claims 6 is "to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle." Office Action (6/29/2006), page 8. The Office Action's motivation is insufficient to establish a *prima facie* case of obviousness in rejecting claim 6.

The Office Action's motivation ("to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle") does not provide reasons, as discussed further below, that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitation of claim 6. Accordingly, the Office Action has not presented a *prima facie* case of obviousness for rejecting claim 6. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

Song addresses the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle. Column 1, lines 39-42. The Examiner has not provided any reasons as to why one skilled in the art would modify Song, which teaches overcoming the problem of having the in-order dispatch less adversely impact a processing system's

ability to dispatch multiple instructions during a single machine cycle, to calculate an instruction address of the next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions located in the entry of the completion table (missing claim limitation of claim 6). The Office Action's motivation ("to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle") does not provide such reasoning. The Office Action has not provided any rationale connection between the Office Action's motivation and calculating an instruction address of the next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions located in the entry of the completion table (missing claim limitation of claim 6). Hence, the Office Action's motivation does not provide reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitation of claim 6. Accordingly, the Examiner has not presented a *prima facie* case of obviousness for rejecting claim 6. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

6. Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest the following claim limitations of claim 21.

Applicants respectfully assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "a completion unit coupled to said instruction fetch unit, wherein said instruction fetch unit is further configured to issue an instruction address and an identification of each of said fetched instructions to said completion unit" as recited in claim 21. The Office Action cites element 76 of Song as teaching a completion unit. Office Action (6/29/2006), page 9. The Office Action further cites element 14 of Song as teaching an instruction fetch unit. Office Action (6/29/2006), page 9. Applicants respectfully traverse.

Song instead teaches that element 76 corresponds to a reorder buffer. Column 7, line 27. Song further teaches that a reorder buffer 76 has sixteen entries

respectively labeled as buffer numbers 0-15. Column 7, lines 28-30. Song additionally teaches that each entry has five primary fields, namely, an 'instruction type' field, a 'number of GPR designations' field, a 'number of FPR designations' field, a 'finished' field, and an 'exception' field. Column 7, lines 30-33. A reorder buffer, as taught in Song, is not a completion unit. Neither is there any language in Song that teaches that reorder buffer 76 of Song receives an instruction address from an instruction fetch unit. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 21, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "a completion table, wherein said completion table comprises a plurality of entries, wherein each of said plurality of entries tracks a consecutive number of outstanding instructions, wherein each of said plurality of entries is configured to store an instruction address of a first of said consecutive number of outstanding instructions and an identification of said first of said consecutive number of outstanding instructions" as recited in claim 29. The Office Action cites elements 302a, 302n of Figure 3 of Kahle as teaching the plurality of entries. Office Action (6/29/2006), page 9. Additionally, the Office Action cites elements 201 and 204a-e of Figure 2 of Kahle as teaching tracking a consecutive number of outstanding instructions. Office Action (6/29/2006), page 9. Furthermore, the Office Action cites elements 208 and 210 in Figure 4 of Kahle as teaching the wherein clause of the above-cited claim limitation. Office Action (6/29/2006), pages 9-10. Applicants respectfully traverse.

Kahle instead teaches that cracking logic 112 is designed to organize a set of fetched instructions into instruction groups 202, where each instruction group 202 includes a set of instruction slots 204a, 204b, 204c, 204d and 204e. Column 3, lines 39-44. Kahle further discloses that in example 1, a set of instructions indicated by reference numeral 201 is transformed into a single instruction group 202 by cracking logic 112. Column 3, lines 61-64. Hence, the citing to elements 201, 204a, 204b, 204c, 204d and 204e does not teach a completion table that includes a plurality of entries, where each of the plurality of entries tracks a consecutive number of

outstanding instructions. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 21, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Kahle further teaches that a single instruction entering cracking unit 112 is broken down into a set of instructions occupying multiple groups 202. Column 5, lines 1-3. Kahle further teaches a conceptualized representation illustrating the operation of microprocessor 100 when an instruction in one of the instruction groups 202 generates an exception is presented. Column 6, lines 44-47. Kahle further teaches that Figure 4 depicts an instruction group 202 that includes a GTAG 208 and instruction address 210. Column 6, lines 51-53. Kahle additionally teaches that GTAG 208 is assigned by dispatch and completion control logic 116 and stored in GTAG field 302 of completion table 118. Column 6, lines 53-55. Hence, elements 208 and 210 relate to fields of an instruction group 202. The instruction group 202 is a set of instructions that is broken down from a single instruction entering cracking unit 112. There is no language in the description of elements 208, 210 of Kahle that teaches that each of the plurality of entries of the completion table is configured to store an instruction address of a first of the consecutive number of outstanding instructions and an identification of the first of the consecutive number of outstanding instructions. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 21, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

7. Claims 22, 29 and 31 depend from independent claim 21, and hence claims 22, 29 and 31 are patentable over Song in view of Kahle and in further view of Siedl for at least the reasons that claim 21 is patentable over Song in view of Kahle and in further view of Siedl.

Claims 22, 29 and 31 each recite the combinations of features of independent claim 21 and hence claims 22, 29 and 31 are patentable over Song in view of Kahle and in further view of Siedl for at least the reasons that claim 21 is patentable over Song in view of Kahle and in further view of Siedl.

8. Claim 22 is patentable over Song in view of Kahle and in further view of Siedl.

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein said completion unit comprises: logic for selecting an identification of one of an instruction finished and an instruction active at one of said first and said second execution unit" as recited in claim 22. The Office Action had previously cited reorder buffer 76 of Song as teaching a completion unit. Office Action (6/29/2006), page 9. The Office Action further cites column 8, lines 21-34 of Song as teaching the above-cited claim limitation. Office Action (6/29/2006), page 10. Applicants respectfully traverse.

Song instead teaches that the execution unit finishes execution of the instruction (such that 'finished'=1 in the instruction's associated entry in reorder buffer 76). Column 8, lines 21-25. Song further teaches that in response to information in reorder buffer 76, dispatch logic 74 determines a suitable number of additional instructions to be dispatched. Column 8, lines 32-34. There is no language in the cited passage that teaches that reorder buffer 76 (Office Action asserts that reorder buffer 76 teaches a completion unit) includes logic for selecting an identification of one of an instruction finished and an instruction active. Neither is there any language in the cited passage that teaches that reorder buffer 76 (Office Action asserts that reorder buffer 76 teaches a completion unit) includes logic for selecting an identification of one of an instruction finished and an instruction active at one of the first and the second execution unit. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 22, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein said completion unit comprises:...logic for calculating an identification of a next to complete instruction using said identification of said selected instruction" as recited in claim 22. The Office Action cites column 5, lines 57-59 and column 6, line 65-column 7, line 1 of Kahle as teaching the above-cited claim limitation. Office Action (6/29/2006), page

10. Applicants respectfully traverse and assert that Kahle instead teaches that the GTAG value is constrained to an integer less than or equal to the number of entries 302 in completion table 118. Column 5, lines 55-58. Kahle further teaches that the LD2 instruction stored in slot 204c may generate any of a variety of exceptions including, address translation exceptions, cache miss exceptions, and a variety of other exception conditions. Column 6, lines 64-67. There is no language in the cited passages that teaches a completion unit that comprises logic for calculating an identification of a next to complete instruction. Neither is there any language in the cited passages that teaches a completion unit that comprises logic for calculating an identification of a next to complete instruction using the identification of the selected instruction. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 22, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein said completion unit comprises:...logic for selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table" as recited in claim 22. The Office Action cites column 5, lines 57-59 and column 6, line 65-column 7, line 1 of Kahle as teaching the above-cited claim limitation. Office Action (6/29/2006), page 10. Applicants respectfully traverse and assert that Kahle instead teaches that the GTAG value is constrained to an integer less than or equal to the number of entries 302 in completion table 118. Column 5, lines 55-58. Kahle further teaches that the LD2 instruction stored in slot 204c may generate any of a variety of exceptions including, address translation exceptions, cache miss exceptions, and a variety of other exception conditions. Column 6, lines 64-67. There is no language in the cited passages that teaches a completion unit that comprises logic for selecting an instruction address. Neither is there any language in the cited passages that teaches a completion unit that comprises logic for selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions. Neither is there any language in the cited passages that teaches a completion unit that comprises logic for selecting an instruction address and

an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 22, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Applicants further assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein said completion unit comprises:...logic for calculating an instruction address of said next to complete instruction using said identification of said next to complete instruction and said selected instruction address and identification of said first of said consecutive number of outstanding instructions located in said entry of said completion table" as recited in claim 22. The Office Action cites column 4, lines 18-23 of Siedl as teaching the above-cited claim limitation. Office Action (6/29/2006), page 10. Applicants respectfully traverse and assert that Siedl instead teaches that in the event of an eviction from L2 cache 106, translator 108 converts the encoded address containing the object ID and the offset into a physical address. Column 4, lines 18-20. There is no language in the cited passage that teaches a completion unit that comprises logic for calculating an instruction address of a next to complete instruction. Neither is there any language in the cited passage that teaches a completion unit that comprises logic for calculating an instruction address of a next to complete instruction using the identification of the next to complete instruction. Neither is there any language in the cited passage that teaches a completion unit that comprises logic for calculating an instruction address of a next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions. Neither is there any language in the cited passage that teaches a completion unit that comprises logic for calculating an instruction address of a next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions located in an entry of the completion table. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 22, since the Examiner

is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

9. Claim 29 is patentable over Song in view of Kahle and in further view of Siedl.

Applicants respectfully assert that Song, Kahle and Siedl, taken singly or in combination, do not teach or suggest "wherein said selected instruction is a most recently finished instruction at one of said first and said second execution unit" as recited in claim 29. The Office Action cites column 8, lines 21-34 of Song as teaching the above-cited claim limitation. Office Action (6/29/2006), page 12. Applicants respectfully traverse and assert that Song instead teaches that the execution unit finishes execution of the instruction (such that 'finished'=1 in the instruction's associated entry in reorder buffer 76). Column 8, lines 21-25. Song further teaches that in response to information in reorder buffer 76, dispatch logic 74 determines a suitable number of additional instructions to be dispatched. Column 8, lines 32-34. There is no language in the cited passage that teaches that the selected instruction is a most recently finished instruction. Neither is there any language in the cited passage that teaches that the selected instruction is a most recently finished instruction at one of the first and the second execution unit. Therefore, the Examiner has not presented a *prima facie* case of obviousness in rejecting claim 29, since the Examiner is relying upon incorrect, factual predicates in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

10. Examiner's motivation is insufficient to establish a *prima facie* case of obviousness in modifying Song with Kahle to include the missing claim limitations of claim 21.

As stated above, most if not all inventions arise from a combination of old elements. See *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Therefore, an Examiner may often find every element of a claimed invention in the prior art. *Id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See *Id.* In order to establish a *prima facie* case of obviousness,

the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). That is, the Examiner must provide some suggestion or motivation, either in the references themselves, the knowledge of one of ordinary skill in the art, or, in some case, the nature of the problem to be solved, to modify the reference or to combine reference teachings. See *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Whether the Examiner relies on an express or an implicit showing, the Examiner must provide particular findings related thereto. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

The Office Action admits that Song does not teach "wherein said completion unit is configured to keep track of when said fetched instructions have been completed, wherein said completion unit comprises: a completion table, wherein said completion table comprises a plurality of entries, wherein each of said plurality of entries tracks a consecutive number of outstanding instructions, wherein each of said plurality of entries configured to store an instruction address of a first of said consecutive number of outstanding instructions and an identification of said first of said consecutive number of outstanding instructions" as recited in claim 21. Office Action (6/29/2006), page 9. The Office Action asserts that Kahle teaches the above-cited missing claim limitations for claim 21. Office Action (6/29/2006), page 9. As understood by Applicants, the Office Action's motivation for modifying Song with Kahle to include the above-cited missing claim limitations of claims 22 is "to minimize the space used by Song and thus decrease the overall size of the processor." Office Action (6/29/2006), page 11. The Office Action's motivation is insufficient to establish a *prima facie* case of obviousness in rejecting claim 22.

The Office Action's motivation ("to minimize the space used by Song and thus decrease the overall size of the processor") does not provide reasons, as discussed further below, that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitation of claim 22. Accordingly, the Office

Action has not presented a *prima facie* case of obviousness for rejecting claim 6. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

Song addresses the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle. Column 1, lines 39-42. The Examiner has not provided any reasons as to why one skilled in the art would modify reorder buffer 76 of Song¹, which teaches overcoming the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle, to: be configured to keep track of when the fetched instructions have been completed, where reorder buffer 76 comprises: a completion table, where the completion table comprises a plurality of entries, where each of the plurality of entries tracks a consecutive number of outstanding instructions, where each of the plurality of entries configured to store an instruction address of a first of the consecutive number of outstanding instructions and an identification of the first of the consecutive number of outstanding instructions (missing claim limitations of claim 21). The Office Action's motivation ("to minimize the space used by Song and thus decrease the overall size of the processor") does not provide such reasoning. The Office Action has not provided any rationale connection between the Office Action's motivation and modifying reorder buffer 76 of Song to be configured to keep track of when the fetched instructions have been completed, where reorder buffer 76 comprises: a completion table, where the completion table comprises a plurality of entries, where each of the plurality of entries tracks a consecutive number of outstanding instructions, where each of the plurality of entries configured to store an instruction address of a first of the consecutive number of outstanding instructions and an identification of the first of the consecutive number of outstanding instructions (missing claim limitations of claim 22). Hence, the Office Action's motivation does not provide reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitations of claim 22. Accordingly, the Examiner has not presented a *prima facie* case of obviousness for rejecting claim 21. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

¹ Office Action asserts that reorder buffer 76 of Song teaches a completion unit.

12. Examiner's motivation is insufficient to establish a *prima facie* case of obviousness in modifying Song with Kahle to include the missing claim limitations of claim 22.

As stated above, most if not all inventions arise from a combination of old elements. See *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Therefore, an Examiner may often find every element of a claimed invention in the prior art. *Id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See *Id.* In order to establish a *prima facie* case of obviousness, the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). That is, the Examiner must provide some suggestion or motivation, either in the references themselves, the knowledge of one of ordinary skill in the art, or, in some case, the nature of the problem to be solved, to modify the reference or to combine reference teachings. See *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Whether the Examiner relies on an express or an implicit showing, the Examiner must provide particular findings related thereto. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

The Office Action admits that Song does not teach "wherein said completion unit comprises:...logic for calculating an identification of a next to complete instruction using said identification of said selected instruction; logic for selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table" as recited in claim 22. Office Action (6/29/2006), page 10. The Office Action asserts that Kahle teaches the above-cited missing claim limitations for claim 22. Office Action (6/29/2006), page 10. As understood by Applicants, the Office Action's motivation for modifying Song with Kahle to include the above-cited missing claim limitations of claims 22 "to minimize the space used by Song and thus decrease the overall size

of the processor." Office Action (6/29/2006), page 11. The Office Action's motivation is insufficient to establish a *prima facie* case of obviousness in rejecting claim 22.

The Office Action's motivation ("to minimize the space used by Song and thus decrease the overall size of the processor") does not provide reasons, as discussed further below, that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitations of claim 22. Accordingly, the Office Action has not presented a *prima facie* case of obviousness for rejecting claim 22. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

Song addresses the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle. Column 1, lines 39-42. The Examiner has not provided any reasons as to why one skilled in the art would modify reorder buffer 76 of Song², which teaches overcoming the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle, to: (1) calculate an identification of a next to complete instruction using the identification of the selected instruction; and (2) select an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table (missing claim limitations of claim 22). The Office Action's motivation ("to minimize the space used by Song and thus decrease the overall size of the processor") does not provide such reasoning. The Office Action has not provided any rationale connection between the Office Action's motivation and calculating an identification of a next to complete instruction using the identification of the selected instruction (missing claim limitation of claim 22). Neither has the Office Action provided any rationale connection between the Office Action's motivation and selecting an instruction address and an identification of a first of a consecutive number of outstanding instructions located in an entry of said completion table (missing claim limitation of claim 22). Hence, the Office Action's motivation does not provide reasons that the skilled artisan, confronted with the same problems

² Office Action asserts that reorder buffer 76 of Song allegedly teaches a completion unit.

as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitations of claim 22. Accordingly, the Examiner has not presented a *prima facie* case of obviousness for rejecting claim 22. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

13. Examiner's motivation is insufficient to establish a *prima facie* case of obviousness in modifying Song with Siedl to include the missing claim limitation of claim 22.

As stated above, most if not all inventions arise from a combination of old elements. *See In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Therefore, an Examiner may often find every element of a claimed invention in the prior art. *Id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. *See Id.* In order to establish a *prima facie* case of obviousness, the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). That is, the Examiner must provide some suggestion or motivation, either in the references themselves, the knowledge of one of ordinary skill in the art, or, in some case, the nature of the problem to be solved, to modify the reference or to combine reference teachings. *See In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Whether the Examiner relies on an express or an implicit showing, the Examiner must provide particular findings related thereto. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

The Office Action admits that Song does not teach "wherein said completion unit comprises:...logic for calculating an instruction address of said next to complete instruction using said identification of said next to complete instruction and said selected instruction address and identification of said first of said consecutive number of outstanding instructions located in said entry of said completion table" as recited in claim 22. Office Action (6/29/2006), page 10. The Office Action asserts that Siedl

teaches this missing claim limitation for claim 22. Office Action (6/29/2006), page 10. As understood by Applicants, the Office Action's motivation for modifying Song with Siedl to include this missing claim limitation of claims 22 is "to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle." Office Action (6/29/2006), page 11. The Office Action's motivation is insufficient to establish a *prima facie* case of obviousness in rejecting claim 22.

The Office Action's motivation ("to utilize the grouped reorder buffer disclosed by Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle") does not provide reasons, as discussed further below, that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitation of claim 22. Accordingly, the Office Action has not presented a *prima facie* case of obviousness for rejecting claim 22. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

Song addresses the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle. Column 1, lines 39-42. The Examiner has not provided any reasons as to why one skilled in the art would modify reorder buffer 76 of Song³, which teaches overcoming the problem of having the in-order dispatch less adversely impact a processing system's ability to dispatch multiple instructions during a single machine cycle, to calculate an instruction address of the next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions located in the entry of the completion table (missing claim limitation of claim 22). The Office Action's motivation ("to utilize the grouped reorder buffer disclosed by

³ Office Action asserts that reorder buffer 76 of Song allegedly teaches a completion unit.

Kahle with the goal of decreasing processor size and the instruction calculating techniques, as disclosed by Siedl, to decrease the complexity of the selection mechanism compared to the ungroup and reissue scheme disclosed by Kahle") does not provide such reasoning. The Office Action has not provided any rationale connection between the Office Action's motivation and calculating an instruction address of the next to complete instruction using the identification of the next to complete instruction and the selected instruction address and identification of the first of the consecutive number of outstanding instructions located in the entry of the completion table (missing claim limitation of claim 22). Hence, the Office Action's motivation does not provide reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would modify Song to include the above-cited missing claim limitation of claim 22. Accordingly, the Examiner has not presented a *prima facie* case of obviousness for rejecting claim 22. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998).

V. ALLOWABLE SUBJECT MATTER:

Applicants appreciate the indication of allowability of claims 7-12, 14, 16-20, 23-28, 30 and 32-36.

VI. CONCLUSION:

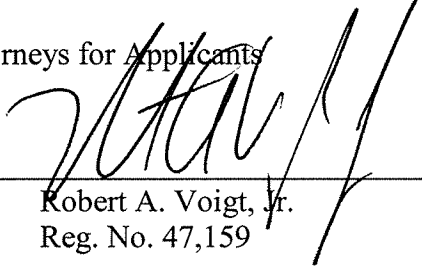
As a result of the foregoing, it is asserted by Applicants that claims 1-36 in the Application are in condition for allowance, and Applicants respectfully request an allowance of such claims. Applicants respectfully request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining issues.

Respectfully submitted,

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